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MINERALOGY AND PETROGRAPHY.[1]

PETROGRAPHICAL NEWS.—In a preliminary notice of the rocks occurring in the neighborhood of Ilchester, Howard county, Md., Mr. Hobbs[2] describes some interesting features of the eruptive masses of the region. The oldest rock within the area studied is a hypersthene-gabbro with its associated alteration products.[3] In the gabbro diorite, originating by dynamic metamorphism from the massive hypersthene-gabbro, ilmenite and rutile are found to be so associated with sphene as to lead the author to regard the rutile as an intermediate product in the alteration of ilmenite to sphene. The end product in the alteration of the gabbro is a typical hornblende-gneiss, in which peripheral granulation of the original feldspar can be detected. A quartz-mica-diorite, in which the quartz is in porphyritic crystals, contains about equal proportions of orthoclase and plagioclase. The most common form of granite, cutting the gabbros and allied rocks, is a coarse pegmatite in which microcline crystals a foot in diameter are sometimes observed. A less common form of granite is a gneissic granite-porphyry, most interesting on account of the occurrence in it of the rare mineral allanite,[4] in parallel intergrowths with epidote.—The diabase pitchstone of Sordaval, in Finland, was for a long time regarded as a mineral, to which the name sordawalite was given. This substance has lately been very carefully studied by Lœwinson-Lessing,[5] who finds it occurring as a dyke, cutting amphibole-schists. In the centre of the dyke the material is highly crystalline; at its edges it is very vitreous. Several types of the vitreous variety are characterized, as hyaline, globulitic, spherulitic and microlitic. The first-mentioned variety gives rise by alteration to several sub-varieties, among which may be mentioned the granellitic and radiolitic varieties. The former consists of a glassy type, in which certain dark particles group themselves so as to produce patches of a dark color on a background of light-colored glass, without the production of a true globulitic or spherulitic structure. In the radiolitic variety devitrification products are divergently arranged around a centre.—The nodules of the coarse granite at Ghistorrai, Sardinia, are described by Fouqué[6] as composed of a centre of orthoclase, oligoclase, biotite and muscovite, around which is a zone consisting of triclinic soda-feldspar and biotite, arranged in concentric layers. The biotite of the nodule is older than the feldspar and remains quite fresh, while the same mineral in the body of the rock is much altered.

[1] Edited by Dr. W. S. Bayley, Colby University, Waterville, Me.
[2] Johns Hopkins Univ. Circ., No. 65, April, 1888, p. 68.
[3] Cf. Amer. Naturalist, 1886, p. 1049.
[4] Cf. Amer. Naturalist.
[5] Min. u. Petrog. Mitth., 1887, ix., p. 61.
[6] Bull. d. l. Soc. Franç d. Min., x., p. 57.

New Minerals.—*Caracolite* from Caracoles, Chili, has lately been described by Sandberger[1] as a new mineral. It is intimately associated with percylite, and like this latter is regarded as derived from galena by alteration. Caracolite occurs in transparent crystals with a hexagonal habit; produced by trillings of rhombic individuals according to the aragonite law. The axial ratio is: $a : b : c = .5843 : 1 : .4213$. Its specific gravity is 5.1. Its analysis yielded results corresponding to the formula $Pb\,(OH)\,Cl + Na_2\,SO_4$. The associated *percylite* was also analyzed and found to correspond to $Pb\,(OH)\,Cl + Cu\,(OH)\,Cl$.—*Mursinskite*[2] has been found only in two small yellow translucent crystals at the topaz locality at Mursinsk, near Alabaschka, in the province of Ekaterinoslaw, Russia. The crystals are tetragonal with an axial ratio, $a : c = 1 : 0.5664$. They are bounded by P, $2P\infty$, $\frac{5}{3}P\infty$, and various ditetragonal pyramids. Their composition is unknown. —*Bementite* is a radially fibrous mineral not unlike pyrophyllite in appearance, which occurs at Franklin, N. J. Its color is grayish yellow, and its specific gravity 2.981. Its composition as described by Prof. König[3] is:—

SiO_2	MnO	FeO	ZnO	MgO	H_2O
39.00	42.12	3.75	2.86	3.83	8.44.

corresponding very nearly to $(H_2\,Mn)_2\,Si\,O_4$.—*Martinite* is a new calcium phosphate from the Island Curaçoa, in the West Indies. It occurs, according to Kloos,[4] only in pseudomorphs after gypsum. Under the microscope it is seen to consist of an aggregate of little rhombohedra. Its specific gravity is 2.892 to 2.896. Its analysis yielded:—

P_2O_5	CaO	H_2O	Org. subs.	Insol.
47.77	47.20	4.52	.75	.20

—*Arseniopleite* is a reddish brown substance associated with rhodonite and hausmannite in veins in a crystalline limestone at the Sjö mine, Gryhyttan, Province of Oerebro, Sweden. Its analysis yielded Igelström[5]:—

As_2O_5	MnO	Fe_2O_3	PbO	CaO	MgO	H_2O
44.98	28.25	3.68	4.48	8.11	3.10	5.67

—*Barysilite*[6] is a lead silicate ($3Pb\,O.\,2Si\,O_2$) from the Harstig iron mine at Pajsberg, Sweden. Its color is white, crystallization hexagonal, hardness about 3, and its specific gravity 6.11 to 6.55.—*Calciothorite*, *Melanocerite* and *Rosenbuschite* are silicates of the rare metals. They are found in the elæolite-syenite veins of Norway.[1] —*Cliftonite.* With reference to certain little cubical crystals of graphite (?) found in pieces of an iron meteorite from Youndequi, Australia, Fletcher[2] states that Haidinger as early as 1846 described crystals of graphite, which he regarded as pseudomorphs after pyrite. Since pyrite does not occur in meteorites, and since, moreover, these little graphite pieces are entirely surrounded by metallic iron, Fletcher thinks that their shape must be original, and that this substance is truly regular in crystallization.

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[1] Neues Jahrb. f. Min., etc., 1887, ii., p. 75, and Websky: Sitzb. Ak. Wissensch Berlin, Nov., 1886.

[2] Kokscharow: Bull. d. l'Acad. Imp. des Sciences d. St. Petersb., 1887, p. 450.

[3] Proc. Acad. Nat. Sc. Phila., Oct., 1887, p. 311.

[4] Sammlg. d. Geol. Reichsmus. Leiden. Ser. ii., Bd. i. Ref. Neues Jahrb. f. Min., etc., 1888, i., p. 41.

[5] Bull. Soc. Min., 1888, xi., p. 39.

[6] Sjögren and Lundström: Oefv. Vet. Ak. Förh., 1888, xlv., p. 7.

CRYSTALLOGRAPHIC NEWS.—It has been known for a long time past that the natural conclusions to be drawn from the Bravais-Mallard theory of cleavage planes and crystal structure, based upon the point system of explaining crystallization, have not been borne out by the facts. As a consequence of this theory it is demanded that the planes of easiest cleavage in a mineral should be parallel to those planes which are most commonly present on it and best developed. This is known, however, not to be the case. Sohncke[3] explains how these difficulties can be met by modifying the theory of the point system, as pointed out by him in recent[4] papers.—The same subject is further discussed by Wulff,[5] who takes up the different crystallographic systems in detail, describes in terms of the theory the inner structure of minerals crystallizing in each, and pictures the development of holohedral, hemihedral and hemimorphic forms. Three lithographic tables, with one hundred figures, illustrate the paper.—Brugnatelli[6] has subjected the *elatholite* occurring in the contact between serpentine and gabbro at the Serra dei Zanchetti, in the Bolognese Appenines in Italy, to a complete examination, both crystallographic and optical. He finds forty-one forms on the crystals examined, among them the new forms $\frac{4}{3}\,P\overline{\infty}$, $2\,P\bar{2}$,$-5\,P5$,$-\frac{3}{2}\,P\bar{3}$–,$\frac{5}{2}\,P\,\bar{5}$ and3 $P\overline{\tfrac{3}{2}}$ ($a : b : c = 1.2657 : 1 : .6354$ $\beta = 89° 51'$). The optical angled measured in oil is 74° 21′ for sodium light, and the first bisectrix is inclined 51′ to the c axis, in the acute angle β. An analysis of the mineral gave $Si\,O_2 = 37.89$, $Ca\,O = 35.04$, $B_2\,O_3 = 21.23$, $H_2\,O = 5.84$.—*Cinnabar* crystals from Mt. Avala, near Belgrade in Servia, have been carefully measured by A. Schmidt.[7] He finds on them trapezohedral forms so largely developed as to determine their habit. To the forty-eight forms already described as occurring on the mineral, Schmidt adds ten new ones, viz.: $\frac{1}{2}\,P2$, $\frac{2}{3}\,P2$, $\frac{6}{13}\,P\frac{6}{5}$, $\frac{2}{5}\,P\frac{4}{3}$, $2\,P\frac{4}{3}$, $2\,P\frac{5}{4}$, $\frac{3}{7}\,P\frac{3}{2}$, $\frac{8}{5}\,P\frac{8}{5}$, $\frac{10}{23}\,P\frac{5}{3}$ and $\frac{5}{6}\,P\frac{5}{3}$.—The negative deltoid dodecahedron $-\frac{3\,O}{2}$

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[1] Brögger: Geol. Fören. Föhr., 1887, ix., p. 247.

[2] Miner. Magazine, July, 1887; and Zeits. f. Kryst., xiii., 1887, p. 383.

[3] Zeitsc. f. Kryst., xiii., 1887, p. 209.

[4] Wiedem. Annalen, 1882, 16, p. 499.

[5] Zeits. f. Kryst., xiii., 1888, p. 503.

[6] Zeits. f. Kryst., xiii., 1887, p. 150.

[7] Zeits. f. Kryst., xiii., 1888, p. 433.

has been detected by Hintze[1] on a crystal of sphalerite from Striegau.

MISCELLANEOUS.—As the result of a series of experiments upon the strongly pleochroic epidote of Sulzbachthal, Ramsay[2] finds that the absorption colors of this mineral are not symmetrically arranged around the axes of elasticity *vi* and *c* lying in the plane of symmetry. Moreover, he finds that the absorption axes—the directions in which the greatest, the least and the mean absorption takes place—do not correspond with the axes of greatest, least and mean elasticity, as had already been indicated by earlier observations. The direction of greatest absorption for the red ray in the clinopinacoid is inclined 28° to the axis of least elasticity, while the direction of absorption of the green ray is inclined 35°. After examining a large number of thin plates prepared from epidote and other monoclinic minerals, and one triclinic mineral, Ramsay concludes (1) that one of the absorption axes in monoclinic crystals coincides with the axis of symmetry *b*, while the other two lying in the plane of symmetry do not necessarily coincide with the axes of elasticity for the same color. In triclinic minerals there is no accordance between the absorption axes and the axes of elasticity. (2) The axes of greatest and of least absorption for any given color in triclinic minerals and the absorption axes lying in the plane of symmetry of monoclinic minerals are not always perpendicular to each other, as are the axes of elasticity.—The same subject is discussed mathematically by Drude,[3] who calculates the positions of absorption maxima in monoclinic and triclinic minerals from data obtained by Ramsay. He finds slight discordances between the observations of Ramsay and the theoretical demands, but concludes that, on the whole, Voight's[4] theory of absorption is substantiated.—By supplying a blast lamp with warm air and with oxygen, Specia[5] has succeeded in fusing many of the minerals infusible under ordinary conditions. The differences in their conduct under these changed conditions may serve to distinguish between minerals having the same general appearance; *e.g.*, quartz is infusible even when the blast lamp is supplied with warm air, while it is easily fusible to a colorless glass when oxygen is used. Colorless topaz is difficultly fusible in the first case, while it fuses readily with intumescence in the second case. Colorless zircon is infusible in both cases, but becomes cloudy at the high temperature produced by the combustion with oxygen.

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[1] Zeits. f. Kryst., xiii., 1887, p. 161.

[2] Zeits. f. Krystallographie, 1887, xiii., p. 98.

[3] Zeits. f. Krystallographie, 1888, xiii., p. 567.

[4] Wiedem. Annalen., 1884, 23, p. 577.

[5] Atti. d. R. Accad. d. Scienze di Torino, xxii., p. 1887. Ref. N. J. B., 1888, i., p. 177.